



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE FISH AND WILDLIFE ENHANCEMENT

Colorado State Office  
730 Simms Street, Suite 290  
Golden, CO 80401

Phone (303) 231-5280

FTS 554-5280

FAX (303) 231-5285



RECEIVED  
U.S.D.O.E.  
R.F.O. MAIL ROOM  
1992 DEC -11 A 7:36

DEC 02 1992

FWE/CO USEPA/USDOE-RFP/OU1-EE  
MAIL STOP 65412



000020080

Mr. Martin Hestmark  
Manager, Rocky Flats Project (8HWM-FF)  
USEPA, Region 8  
999 18th Street, Suite 500  
Denver, Colorado 80202-2466

Dear Mr. Hestmark:

At the informal request of the U.S. Environmental Protection Agency (EPA), Region 8, Rocky Flats Project, the U.S. Fish and Wildlife Service has reviewed the document entitled, "Draft Final, Phase III, RFI/RI Report, Rocky Flats Plant, 881 Hillside Area (Operable Unit No. 1), Volume XIII, Appendix E, Environmental Evaluation," published by the U.S. Department of Energy (DOE), Rocky Flats Plant, Golden, Colorado, October 1992.

The Service referred to the EPA document entitled, "Framework for Ecological Risk Assessment," EPA/630/R-92/001, February 1992 (EPA Framework document), as the basis for our comments.

Our overall comments to the subject document are outlined here. Specific comments are enclosed.

In general, the Service finds the ecological risk assessment conducted at OU1 and the report as detailed in the subject document to be inadequate and inconsistent with guidance for conducting ecological risk assessments outlined in the EPA Framework document.

A-OU01-000807

18338

MSH  
20

Although DOE cites the draft version of the EPA Framework document in its references within the subject document, we believe that (1) the basic guidance outlined in the final version of the EPA Framework document is consistent with the draft version, and (2) the final version of the EPA Framework document was published sufficiently ahead of the subject document that DOE should incorporate the final version as their reference. Consequently, the ecological risk assessment for OU1 appears flawed with respect to process. For example, on page E-5 of the subject document, DOE states, "There are five elements in the ecological risk assessment process: Data Collections, Data Evaluation, Toxicity Assessment, Exposure Assessment, Risk Characterization." However, guidance in the EPA Framework document clearly characterizes the steps (phases) of ecological risk assessment as (1) Problem Formulation, (2) Analysis, and (3) Risk Characterization. It appears that contractors for DOE commenced field data collection before conducting the Problem Formulation phase. This may be construed that measurement and assessment endpoint identification, fundamental steps critical to the successful completion of an unbiased ecological risk assessment, did not take place until after data had already been collected, if at all. As presented, the results and conclusions of the OU1 ecological risk assessment may not be warranted and, in our opinion, cannot be substantiated on the basis of the guidance published in the EPA Framework document. Based on DOE's application of process, their results and conclusions could be construed to be predetermined.

To restore credibility to the ecological risk assessment for OU1, the Service recommends DOE implement the following:

- All presently existing data, results, and conclusions related to the OU1 ecological risk assessment should be temporarily set aside.

- DOE should conduct a scoping process for OU1 based on the Problem Formulation step contained within the EPA Framework document. Data Quality Objectives (DQOs), especially valid measurement and assessment endpoints, should be identified based upon a preliminary characterization of exposure effects, an examination of scientific data and data needs, policy and regulatory issues (specifically identified as ARARs where appropriate), and site-specific factors that influence and define the feasibility, scope, and objectives for the ecological risk assessment. The Service recommends EPA oversee this process and ensure consistency with its Framework document.
- Upon completion of the Problem Formulation step, and consistent with the EPA Framework document, DOE should proceed to the second phase to (1) characterize exposure and (2) characterize ecological effects, especially at and beyond the population level of biological organization where appropriate. No later than this stage, a determination should be made whether additional data is required, especially if the data to be collected requires further field work. Constraints for acquiring such data should be considered and appropriate decisions concerning time deadlines should be evaluated.
- At the third phase, DOE should return to the existing data and any additional data collected to conduct the risk characterization. Likelihood of adverse effects and their magnitude in relation to temporal and spatial factors should be considered. A process to validate and verify the conclusions of the ecological risk assessment should be identified and implemented.

The Service understands and appreciates that EPA as the CERCLA regulatory agency must decide how to integrate OU1 Environmental Evaluation (EE) work within the constraints of the Rocky Flats Interagency Agreement. The process outlined above, with the possible exception of having to acquire additional necessary field data, could be accomplished within 30 days. The Service believes that further data acquisition requiring additional field work can and should be undertaken.

Mr. Martin Hestmark

4

However, it may be undertaken as part of the verification/validation process previously described. This action allows the final version of the EE to be published with the provision that it will be updated as new data, results, and conclusions warrant. To do so is consistent with the iterative approach emphasized within the EPA Framework document.

This comprises general Service comments to the subject document. Our specific comments are enclosed. The Service foresees that much of the process of conducting a valid ecological risk assessment for OU1 will save time, effort and costs for implementing valid ecological risk assessments at all other OUs.

The process outlined in the EPA Framework document also is applicable for conducting a comprehensive site-wide ecological risk assessment as requested by the Service in previous correspondence to the parties to the Rocky Flats Interagency Agreement.

Service comments provided here are intended solely as technical assistance and do not constitute a position the Department of Interior may take in a subsequent Preliminary Natural Resource Survey regarding possible adverse impacts/injury to natural resources.

Please contact John Wegrzyn at (303) 231-5280 if you or your staff have questions or require further information. The Service appreciates the opportunity to provide technical comments to EPA on these issues.

Sincerely,

A handwritten signature in dark ink, appearing to read "LeRoy W. Carlson". The signature is fluid and cursive, with the first name "LeRoy" being more prominent.

LeRoy W. Carlson  
Colorado State Supervisor

Enclosure

Mr. Martin Hestmark

5

cc: FWE/ARD Region 6  
FWE/SLC  
FWE/GJ

cc w/encl: USDOE-Rocky Flats (Attn: James Hartman,  
Richard Schassburger, Scott Grace, Bruce Thatcher)  
CDH (Attn: Gary Baughman)  
CDNR (Attn: Ron Cattany  
CDOW (Attn: Dave Weber)

Reference: OU1EE4.LET  
Reading File  
File: EC/Superfund/Rocky Flats

U.S. FISH AND WILDLIFE SERVICE  
FISH AND WILDLIFE ENHANCEMENT, COLORADO STATE OFFICE  
GOLDEN, COLORADO

Specific Comments to Document Entitled, "Draft Final, Phase III,  
RFI/RI Report, rocky flats Plant, 881 Hillside Area,  
(Operable Unit No. 1), Volume XIII, Appendix E,  
Environmental Evaluation," U.S. Department of Energy,  
Rocky Flats Plant, Golden, Colorado, October 1992

November 1992

Executive Summary:

- p. xv, ¶2: The last sentence in this paragraph states, "The EE assesses ecological risk for identified COCs that are above background levels and compares the structure and function of the ecosystem at the OU1 study area."

It is unclear as to what "...the structure and function of the ecosystem..." is compared against. The Service believes the purpose of conducting an ecological risk assessment within an Environmental Evaluation (EE) is to 1) identify and scope potential environmental problems, 2) establish environmental priorities and 3) provide a scientific basis for decision making and regulatory action.

- p. xv, ¶4: The second sentence of this paragraph states that the ecological risk assessment steps followed were, "data collected, data evaluation, toxicity assessment, exposure assessment and risk characterization."

In the Service's view, the appropriate steps in ecological risk assessment are consistent with those in EPA guidance, "Framework For Ecological Risk Assessment," EPA/630/R-92/001, February 1992 (EPA Framework document). These are 1) Problem Formulation, 2) Analysis, and 3) Risk Characterization.

Prior to conducting the actual risk assessment process, the Problem Formulation phase must provide a preliminary characterization of potential exposure to stressors including, but not limited to, chemical, physical, behavioral and others, and their potential effects upon plant and animal populations, terrestrial and aquatic communities, and potentially the ecosystem(s) at risk. This first step should also include a scoping of the following:

- Identification of existing data and a data needs/data gap assessment
- Identification of pertinent policies and regulatory issues, including ARARS

- Identification of site specific factors, including feasibility of assessing risks, scope of the risk assessment and the objectives of the risk assessment.
- p. xvi, ¶1: the last sentence states, "The most important factor affecting species diversity in communities at RFP is the amount of moisture available to support plant growth, the primary producers in the food web, and food for animals."

This statement is a sweeping generalization. It should be substantiated with documentation and cited references.

- p. xvi, ¶2: It appears that air was not considered to be a significant pathway of exposure. Air should be substantively evaluated as an exposure pathway and documentation should be presented why it is not a significant source of inhalation exposure for various life stages of wildlife species or for aerial deposition of environmental contaminants to aquatic systems at RFP potentially affecting various life stages for aquatic species.

It appears that potential additive and synergistic effects of stressors have not been substantially evaluated. Additive and synergistic effects among stressors must be an integral part of evaluating ecological risks.

- p. xvi, ¶3: The third sentence of this paragraph states, "Most metals did not exceed background concentration by more than twofold and probably," (emphasis added), "do not represent contamination from releases at RFP."

The Problem Formulation phase of conducting an ecological risk assessment allows for statement of assumptions under which the risk assessment will be conducted. However, documentation of the basis for those assumptions must be provided. This basis is not provided in the subject document. A mechanistic process should be included in the Problem Formulation phase to evaluate under what circumstances metals will be considered to be the result of uncontrolled releases to the environment. A process must be pursued for each environmental matrix in both biotic and abiotic categories. The statement is inconsistent with having undertaken such a process(es). This issue should be revisited unless it can be demonstrated that a rigorous approach embodying the characteristics above has been taken.

- p. xvi, ¶3: The first sentence states, "The background concentration of COCs at RFP was assumed to be below the toxicity threshold for metals of ecological receptors."

This sentence is unclear and should be rewritten.

- p. xvii, ¶3: The first sentence states, "Chromium risks were assessed for soils and surface water."

The Service believes that the intent of the sentence is that concentrations of chromium in soils and water matrices were assessed for toxicological risks to biota. However, this concept is not clearly communicated. Details of how this assessment was accomplished are not stated nor referenced. As expressed, the information furnished is insufficient.

- p. xvii, ¶3: The third sentence states that chromium was above background levels in surface water in a single sample. The sentence does not state how the term, "background levels," applies; i.e., total, dissolved, or otherwise bioavailable component.

- p. xviii, ¶1: The last sentence states, "Lead concentration in biological tissue from OU1 indicate minimal uptake of lead."

What biological species were evaluated as most susceptible to adverse toxicological effects from lead? Against what concentrations of lead was toxicity evaluated? Was any monitoring or verification done to ensure validity of the data? No discussion of these points is made, cited nor referenced.

- p. xviii, ¶3: This paragraph states, "Mercury concentration in surface water samples did exceed background in two sites on branches of Woman Creek that drain areas south of the RFP industrial area. However, these areas are outside potential impact from OU1," (emphasis added), "areas and the concentrations exceeded background by less than 30 percent. Mercury concentrations did exceed background in surface water samples at two stations in the South Interceptor Ditch; however, the source is likely upgradient of OU1 sources and the water from the South Interceptor Ditch, ..."

Mobile biota species resident within OU1 are likely to be exposed to contaminants from within OU1 as well as from sources beyond OU1. For example, biota residing within OU1 are potentially at risk of exposure to contaminants from the South Interceptor Ditch. It is unclear to us how total exposure of biota from all potential sources of a given contaminant is being handled by this ecological risk assessment. To our knowledge, no concise mechanism has been described within this ecological risk assessment for evaluating biota exposure from sources beyond the geographical boundaries from which they reside. This situation leads to ambiguity in assessing OU1 ecological risks, as well as ecological risks for other Ous.



This is why the Service requested in a letter to the parties to the Rocky Flats IAG that a comprehensive ecological risk assessment be conducted for the entire Rocky Flats site. Thirty percent of background concentrations may equate to an ecologically significant exposure for species that are especially susceptible to mercury toxicity or are exceptionally stressed from other factors. No discussion of this issue is made, cited or referenced.

- p. xviii, ¶3: This paragraph states, in part, "The highest concentration of mercury in surface water from the single station in the South Interceptor Ditch was 1.0 µg/l; the HQ value indicates a moderate risk. ...The acute and chronic Colorado Water Quality Standards for mercury are 2.4 and 0.1 µg/l," (emphasis added), "respectively. Therefore, overall risk to ecological receptors from mercury exposure at OU1 is judged to be low."

Since neither measurement endpoints nor assessment endpoints were identified in a Problem Formulation phase for the OU1 ecological risk assessment, the toxicological relationship between mercury concentrations in abiotic matrices and mercury concentrations in biotic matrices cannot be properly evaluated.

- p. xix, ¶2: We suggest that the word "adversely" be inserted to modify the phrase from, "...selectively impacts...", to, "...adversely impacts...", in the second sentence.
- p. xix, ¶3: This paragraph implies that ecological risk assessment is based solely on evaluations of taxonomic structure and trophic level function. Ecological risk assessment is based on selected measurement endpoints as they relate to assessment endpoints. Measurement endpoints are measurable responses to a stressor, or combination of stressors, that are related to valued characteristics chosen as assessment endpoints. Assessment endpoints are explicit expressions of an actual environmental/ecological value to be protected. Usually assessment endpoints cannot be measured directly with ease.

In many instances a documented cause-effect relationship(s) is directly observed, usually in or on a single organism, as a measurement endpoint. By extrapolating these observations via a weight of evidence approach to populations, or successively higher levels of biological organization, potential adverse impacts to an ecosystem(s) or component thereof may be evaluated.

The approach outlined in this OU1 ecological risk assessment appears to operate on the assumption that ecological risk can be evaluated merely by assessing functional equivalency of taxonomic structure and functional trophic levels. This is a false premise. One species occupying a specific ecological niche might displace another in that niche. The displacing act may substitute a species that performs very well. Observations of niche structure/trophic interaction could be assessed as "normal" or "not adversely affected." However, if the displacement of a species is caused by or can be attributed to a component of biotic stress caused by a COC released to the environment in an uncontrolled manner, then an adverse effect on the biological system, i.e., natural resource injury, has occurred.

- p. xix, ¶4: The statement, "The terrestrial ecosystem revealed no difference between the percentage of small mammalian species at OU1 and the Rock Creek reference area" substantiates the preceding comment. The fact that a functional equivalency of biological organization exists between areas is not proof that adverse effects to populations of individual species of small mammals within the OU1 target area have not occurred. This is an inappropriate comparison.

The Service believes a change of species composition within OU1, resulting from an observed measurement endpoint that logically correlates with the uncontrolled release of a COC, as prima facie evidence of natural resource injury. It matters not that the trophic level at which the species occurs is functioning at a degree comparable to the reference area.

## E1.0 INTRODUCTION

### E1.2.2 Definition and Concept of Ecological Risk Assessment

- p. E-2, ¶1: The first sentence states, "Ecological risk assessment is a procedure that estimates the possibility of adverse effects occurring..."

Ecological risk assessment is a process that attempts to evaluate the probability that adverse ecological effects have occurred, are occurring or may occur as a result of exposure to one or a combination of stressors.

- p. E-2, ¶1: We suggest that the last phrase within the last sentence be altered to read, "as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA) and other Federal environmental statutes designed to protect natural resources."

- p. E-2, ¶2: This paragraph outlines a three step process employed by DOE to assess ecological risk at OU1. However, while the process described is vaguely similar to the process for conducting ecological risk assessment outlined in the EPA Framework document, it lacks sufficient comparable detail as contained in the Framework document.

The Service believes that failure to incorporate a sufficient level of detail in the first phase of the assessment led the process astray. We maintain that accomplishing sufficient detail requires the following activities be rigorously performed:

- The first step is a Problem Formulation phase incorporating the following activities:
  - Identification of potential contaminants of concern
  - - Identification of measurement endpoints and assessment endpoint
  - Examination of existing data and identification of data gaps
  - Identification of policy and regulatory issues; e.g., formally identifying ARARs
  - Identification of OU1 site specific factors; 1) those geographically within OU1 potentially influencing biota resident to OU1 and 2) those geographically outside of OU1 potentially influencing biota within OU1
  - Define the feasibility, scope and objectives for this ecological risk assessment; state the assumptions under which the assessment will be conducted and how these assumptions will/will not affect results and conclusions of the assessment; state how results and conclusions, with their associated qualifications, will be used in decision making

- Second step, Characterize potential exposure of biota to COCs
  - Conduct a preliminary quantitative and qualitative evaluation of exposure
  - Identify potential adverse cause-effect relationships between COCs and biota
  - Characterize potential adverse ecological effects
- Third step, Use results of second step to characterize ecological risks to provide a complete picture of the analysis
  - Summarize final assumptions
  - Define scientific uncertainties
  - Define strengths/weaknesses of the analyses
  - Describe potential ecological significance of risks including types, magnitudes of potential effects, spatial/temporal patterns, and the likelihood for ecological recovery
  - State how the ecological risk assessment will be verified and validated through continued monitoring.

This approach should be implemented to assess ecological risk at OU1, at all other RFP Ous and for undertaking the comprehensive sitewide ecological risk assessment requested by the Service in a June 30, 1992 letter to the parties to the Rocky Flats Interagency Agreement.

#### E1.4 SCOPE OF THE INVESTIGATION

##### E1.4.1 Study Location and Duration

- p. E-3, ¶1: On what basis was the period of collection determined? Data gap filling and data collection should be justified through a process of measurement endpoint and assessment endpoint selection as described above. Measurement endpoints and assessment endpoints should not be selected with RFP-IAG deadlines as their sole basis. As currently presented, it is an example of how this report is inconsistent with the EPA Framework document.

- p. E-3, ¶3: Is the OU1 geographical boundary synonymous with the OU1 Study Area geographical boundary? How will risks to OU1 resident biota from sources geographically within OU1 be compared and segregated with risks to OU1 resident biota from sources outside the OU1 geographical boundary? How will significance from individual and multiple environmental sources of ecological risk be ascribed and defined?

These issues should be discussed in more detail.

- p. E-4, ¶2: Has EPA agreed that the Rock Creek watershed is adequately similar to the reach of Woman Creek within OU1 to qualify it as a reference area? There appears to be ample basis within various area of the subject document to disqualify Rock Creek on the basis of slope, directional trend, geomorphology, habitats, etc.. The Service believes this issue should be explored further unless EPA has previously agreed that Rock Creek should be considered a reference area for OU1.

#### E1.5 COMPONENTS OF ECOLOGICAL RISK ASSESSMENT

- p. E-5, ¶2: This paragraph states, "There are five elements in the ecological risk assessment process:
  - Data Collections
  - Data Evaluation
  - Toxicity Assessment
  - Exposure Assessment
  - Risk Characterization"

This outline is inconsistent with the EPA Framework document. Also, it should be noted that data collections should not be undertaken until pre-existing data has been evaluated in conjunction with justifiable measurement endpoints and assessment endpoints established within the Problem Formulation phase, as outlined above in previous comments.

- p. E-5, ¶3: The first sentence states, "Existing data were screened to determine if additional data collections were required."

It appears that data (pre-existing data) may not have been adequately screened since neither measurement endpoints nor assessment endpoints were established prior to entering the field to collect additional data. This issue requires further discussion here.

- p. E-5, ¶3: The second sentence states in part, "Data quality objectives (DQOs) were identified in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA 1987)..."

DQOs must be established in conjunction with the EPA Framework document. The EPA Framework document, final version, was published in February 1992, eight months prior to publication of the OU1 EE. The draft version of the EPA Framework document is virtually consistent and was cited by DOE elsewhere in the subject document, yet it does not appear here as a cited reference. Further, an EG&G commissioned report entitled, "Environmental Evaluation Methodologies For Individual Hazardous Substance Sites," F. W. Whicker, et. al., Colorado State University, February 1991, is neither cited nor listed in the references.

- p. E-5, ¶3: The second sentence of this paragraph speaks of considering uncertainties related to weight of evidence for a given chemical's toxicity for ecological receptors.

Valid cause-effect relationships evaluated under justifiable measurement endpoints and assessment endpoints must be determined before extending information to a weight of evidence treatment. Doing so reduces uncertainty and assists in better defining ecological risks. Again, we must reiterate that valid, justifiable measurement endpoints and assessment endpoints appear to be lacking in conjunction with undertaking a valid Problem Formulation phase for the ecological risk assessment at OU1.

- p. E-5, ¶3-p. E-6, ¶1: Standards for protecting the environment referenced as, "given in EPA documents and State of Colorado codes (EPA 1992b; CCR 1989)" should be identified as ARARs.

The Service maintains that, on a site by site basis, these standards may not be protective of biota. In order to adequately assess ecological risk associated with the uncontrolled release of environmental contaminants, ecological risk associated with these standards must also be evaluated. It is conceivable that, because of site specific environmental conditions at RFP, the uncontrolled release of any amount of an environmental contaminant could cause adverse effects to biota.

- p. E-8, ¶2: While the paragraph states that average wind speed in the spring is approximately 10 mph, the Service believes that documentation exists demonstrating wind gusts approaching or exceeding 100 mph. A discussion of wind generated dispersal of environmental contaminants potentially affecting aquatic and terrestrial biosystems at OU1 seems appropriate.

**E2.1.2 Physiography and Topography**

- p. E-8, ¶3: The last two sentences of this paragraph states, "the creek drainages vary from moderate slopes in lower Woman Creek and Walnut Creek to quite steep in upper Rock Creek. Rock Creek's steeper ravines have a southwest to northeast orientation while the other two creeks have wider valleys that trend east to west."

It appears that an argument is made here for disqualifying Rock Creek as a reference area for the reach of Woman Creek and its associated aquatic and terrestrial ecosystems residing within the geographical boundary of OU1.

**E2.2 BIOLOGICAL**

**E2.2.3 Important (Target) Species and Habitats**

- p. E-13, ¶1: The Service suggests that a minimum of two potentially susceptible species should be evaluated at each trophic/guild/food web level.
- p. E-14, ¶1: The next to last sentence of this paragraph states, "Also, these organisms were determined to be at high risk because of intimate contact with potentially contaminated soils or surface water."

How are risks for organisms that constitute food webs and prey bases for organisms beyond OU1 to be handled?

**E2.2.4 Threatened and Endangered Species**

- p. E-14, ¶1: Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is discussed. It is unclear if the intent of the discussion is to identify the mouse as vulnerable because of its listing status or because it is vulnerable by virtue of its resident status within OU1.

Species such as peregrine falcons and bald eagles may take prey species that are resident within OU1. Risk to these species should be discussed.

Risks should also be discussed, under a separate heading(s), for migratory species and non-migratory species that could potentially utilize OU1 natural resources in food webs and prey bases.

**E3.0 METHODOLOGIES FOR ECOLOGICAL EVALUATION**

- p. E-15, ¶1: This paragraph references dated EPA guidance as the basis for the risk assessment procedures utilized at OU1. Again, the EPA Framework document should be the basis for the ecological risk assessment process undertaken at OU1.

The Service recommends using the term "biological receptors" in place of the term "ecological receptors," in the second sentence. The word "ecological" generally is used in the scientific literature to refer to a system of biological organization as opposed to a target organism, organ, etc., that may constitute a susceptible target for an environmental contaminant.

**E3.1 APPROACH FOR ECOLOGICAL RISK ASSESSMENT**

- p. E-15, ¶1: DOE cites the draft EPA Framework document as a basis for assessment of ecological risk at OU1. However, the Service believes the final version of the EPA framework document, not the draft, should be referenced.

The five steps cited as the approach for ecological risk assessment at OU1:

- ".
- Description of risks in terms of assessment endpoint
- Discussion of ecological significance of effects
- Summarization of overall confidence in the assessment
- Discussion of results with the risk manager"

are inconsistent with the steps for ecological risk assessment outlined in the EPA Framework document. Also, the steps outlined here appear inconsistent and are confusing with the five elements listed under "E.15 COMPONENTS OF ECOLOGICAL RISK ASSESSMENT," page E-5, ¶1, which also are inconsistent with the EPA Framework document.

Before describing ecological risks in terms of assessment endpoints, identification of measurement endpoints and justification of their relationship to assessment endpoints must be done. This process is consistent with the Problem Formulation phase of ecological risk assessment presented in the EPA Framework document.



## E3.2 CONCEPTUAL MODEL

### E3.2.1 Components of Conceptual Model

- p. E-16, ¶1: The conceptual model should specifically describe the potentially susceptible species comprising food web and trophic level interactions for OU1 based on species lists from the Baseline Characterization of the Terrestrial and Aquatic Habitats at RFP and information that should be generated in the Problem Formulation phase outlined in the EPA Framework document

If incorrect or weak relationships are made upon which the conceptual model is developed, risk of adverse effects of an environmental stressor on OU1 target species and succeeding levels of biological organization potentially affected by OU1 may be incorrectly estimated.

### E3.2.2 Release Mechanisms and Exposure Pathways

- p. E-16, ¶1: The last sentence on this page states, "Species that are larger and longer-lived (e.g., coyotes and mule deer) are more mobile and thus spend a smaller proportion of their lives within the area of contamination."

This statement should be a conclusion of the risk assessment and not a supposition. An absence of data concerning valid cause-effect relationships proves nothing. Such a statement must be supported by facts specifically related to conditions and circumstances at RFP.

- p. E-18, ¶1: The first complete sentence on this page states, "Ingestion of contaminated soils is of less concern for deer and birds, primarily because they are more wide-ranging and spend less time in contact with the soil."

As with the preceding comment, this statement is a supposition, to our knowledge, not substantiated in fact. Deer and some species of birds may be the targets of other stressors that, upon exposure to the OU1 components, might cross a toxicological threshold eliciting a significant adverse effect. Proper consideration during the Problem Formulation phase of ecological risk assessment will lead to the selection of appropriate measurement and assessment endpoints to evaluate these types of issues.

- p. E-18, ¶2: The second sentence states, "In general, bioaccumulation is limited relative to persistent organic pollutants such as chlorinated organic pesticides."

This statement is confusing as written. The phenomenon of bioaccumulation is exemplified by organochlorine pesticides but is by no means limited to the organochlorine class of chemicals. We suggest that this paragraph be re-drafted to clarify and contrast the term "bioaccumulation" with "biomagnification" in the next paragraph.

### E.3.3 DATA COLLECTION

#### E3.3.4 Uncertainty Analyses for Data Collections

- p. E-26, ¶1: This paragraph states in part, "Budget and time limitations precluded the inclusion of quantitative surveys."

As commented upon previously, the Service understands that mechanisms allowing for adequate time to conduct a valid ecological risk assessment are available under the IAG. DOE should be granted adequate time to conduct a valid EE for OU1, succeeding Ous and the comprehensive sitewide ecological risk assessment previously requested by the Service.

- p. E-26, ¶2: The first sentence states, "Gross estimates of biological uptake of contaminants was deemed adequate for this first phase of analysis, so the gastrointestinal (GI) tract and fur (mammals) of the specimens were not separated."

This statement is illogical. Whole body analysis is a measure of contaminant availability within the food web and prey base. Whole body analysis cannot be substituted for evaluating adverse effects on target organs, organ and physiological systems in conjunction with biomarkers. The Service strongly disagrees with this reasoning.

- p. E-26, ¶2: The last sentence of this paragraph states, "Animals which had just eaten could have higher contaminant levels than those which had an empty GI tract,..."

While this could be true on a case by case basis, the Service disagrees in general. Animals could also have lower whole body concentrations because of a full GI tract. This statement is logically flawed.

#### **E4.0 RESULTS**

##### **E4.1.1 Conceptual Model**

- p. E-51, ¶1: The last sentence states, "Exposure through trophic interactions were identified as minor components since the COCs are primarily heavy metals."

The Service disagrees with this assessment. For example, mercury is an example of a heavy metal that exhibits exceptional bioaccumulation/biomagnification tendencies. Also, a stressor or combination of stressors may adversely affect small area or key species and can have devastating effects if that species provides a key prey base/food web link at certain times or seasons of the annual cycle.

##### **E4.1.2 Identification of Contaminants of Concern**

- p. E-51, ¶1: The second paragraph states, in part, "The COCs included heavy metals, cyanide and radionuclides that had been detected at concentrations above background ... the second stage screening process was based primarily on exceedance of RFP background concentrations, and secondarily on relative toxicity and bioavailability."

Within a Problem Formulation phase for an ecological risk assessment at OU1 a provision should be made to assess relative toxicity of susceptible species at background concentrations. The Service suggests that a baseline toxicological assessment is desirable and necessary to account for site specific conditions at RFP. For example, it may be that in some site specific areas, some level of toxicity is present even at background concentrations.

#### **E5.0 SUMMARY**

- p. E-79, ¶1: The last sentence of this paragraph states, "An ecosystem may become dysfunctional if chemical concentrations are such that species are eliminated."

The Service agrees with this concept as far as it goes. However, the Service maintains that an ecosystem may become dysfunctional if contaminants exposure is such that species composition or the number of individuals within a population are altered or replaced by individuals of another species. The Service believes if one species supplants another by virtue of an uncontrolled release or spill of a hazardous substance, natural resource injury has taken place, even if the trophic level within the ecosystem remains functional. This is because some species are more tolerant to specific stressors, or stress in general, than the species they replace.

E6.0 CONCLUSIONS

- p. E-82: In general, the Service finds that it cannot support the conclusions on the basis of the process that DOE utilized to perform the ecological risk assessment for OU1.

As stated previously, the Service believes that the ecological risk assessment for OU1 is inadequate. Current EPA guidance as outlined in the EPA Framework document was apparently not followed, nor was the subject EE report document formatted after EPA guidance. The Service believes that the primary difficulty is with the Problem Formulation phase of this ecological risk assessment. Since the following two phases of the EPA guidance are dependent on the adequacy of the Problem Formulation phase, the results and conclusions are suspect. In the cover correspondence to EPA accompanying these comments the Service makes recommendations to EPA on how DOE might rectify the problems embodied within this ecological risk assessment for OU1.

(OU1COM.DOC)